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## Paulsboro Train Derailment

Paulsboro, NJ - EPA Region II  
POLREP #11

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U.S. ENVIRONMENTAL PROTECTION AGENCY  
POLLUTION/SITUATION REPORT  
Paulsboro Train Derailment - Removal Polrep



### UNITED STATES ENVIRONMENTAL PROTECTION AGENCY Region II

**Subject:**

**POLREP #11  
Paulsboro Train Derailment**

**Paulsboro, NJ**

**Latitude: 39.8345751 Longitude: -75.2368212**

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**From:**

Dwayne Harrington, OSC  
Paul L. Kahn, OSC

**Date:**

12/9/2012

**Reporting Period:****1. Introduction****1.1 Background**

<b>Site Number:</b>	A22R	<b>Contract Number:</b>	
<b>D.O. Number:</b>		<b>Action Memo Date:</b>	
<b>Response Authority:</b>	CERCLA	<b>Response Type:</b>	Emergency
<b>Response Lead:</b>	PRP	<b>Incident Category:</b>	Removal Action
<b>NPL Status:</b>	Non NPL	<b>Operable Unit:</b>	
<b>Mobilization Date:</b>	11/30/2012	<b>Start Date:</b>	11/30/2012
<b>Demob Date:</b>		<b>Completion Date:</b>	
<b>CERCLIS ID:</b>	NJN000206653	<b>RCRIS ID:</b>	
<b>ERNS No.:</b>		<b>State Notification:</b>	
<b>FPN#:</b>		<b>Reimbursable Account #:</b>	

**1.1.1 Incident Category**

Transportation Related - Conrail train car derailment

**1.1.2 Site Description****1.1.2.1 Location**

At approximately 0700 EST on 30 November 2012, Thirteen Conrail freight cars transporting chemicals and other goods derailed and overturned at a bridge crossing the Mantua Creek in Paulsboro, New Jersey. The incident occurred near the 200 block of East Jefferson Street. The Department of

Transportation reported three cars fell into the creek. Conrail reported one of the tank cars released approximately 180,000 pounds of vinyl chloride into Mantua Creek. Onlookers also reported seeing a vapor cloud rise from the scene.

Mantua Creek is a stream in Mantua Township in Gloucester County. It flows northwest for 18.6 miles to the Delaware River at Paulsboro across from the Philadelphia International Airport. The FAA reports airport operations were unaffected. Mantua Creek is approximately 150 feet wide at the location of the bridge collapse. The incident occurred approximately 1.4 miles upstream of the outlet into the Delaware River.

The NTSB has been on scene since 1400 hours on 30 November 2012 conducting their investigation.

#### **1.1.2.2 Description of Threat**

USCG, NJDEP, EPA and Gloucester County Emergency Response, including HAZMAT, responded to the incident. Gloucester County Emergency Response initially ordered residents to shelter-in-place. A half-mile radius evacuation zone was also issued for local residents. Paulsboro High School was placed on lockdown at 0715 EST. The school was later dismissed. The Transportation Security Operation Center reported that 18 residents reported possible effects from the spill and were placed in a staging area for decontamination.

Vinyl chloride is an industrial chemical described as a colorless gas with a sweet odor and known to be highly toxic, flammable and carcinogenic. It is primarily used in the production of PVC. According to the Environmental Protection Agency, short-term exposure to high levels of vinyl chloride in the air has resulted in central nervous system effects such as dizziness, drowsiness and headaches.

Two VCM cars were directly involved in the accident. One car was pierced and off-gassed approx. three quarters of the 22,000 gallons of VCM. Self-refrigeration froze the remaining VCM inside the car. An oil sheen was observed and is attributed to hydraulic fluid from the bridge entering the creek. Hard and soft boom was deployed on the creek by private contractor.

#### **1.1.3 Preliminary Removal Assessment/Removal Site Inspection Results**

On November 30, 2012, EPA initiated air monitoring with the TAGA unit based in Edison, NJ. Preliminary results for VCM revealed ambient levels up to 1.3 ppm using actual GCMS.

## **2. Current Activities**

### **2.1 Operations Section**

#### **2.1.1 Narrative**

#### **2.1.2 Response Actions to Date**

Refer to POLREPs 1 thru 10 for previous response actions.

#### **DECEMBER 4, 2012**

During this operational period, air monitoring operations continued with nine AreaRAEs providing real-time VOC results through the Viper System. In addition, two mobile RST teams equipped with PIDs are roving the neighborhood and responding to readings observed on the AreaRAEs. The ERT TAGA bus continued to perform real-time analytical, focusing on the perimeter of the evacuation zone and responding to validate PID readings.

Due to the observation of VOCs beyond the perimeter of the evacuation area intermittently over the past two nights, Incident Command expanded the evacuation area one block to the north and to the west impacting approximately 100 additional homes. The shelter-in-place order remains in effect for the town.

As of 0700 hours 12/4, VOC levels varied from 0 ppm to 10 ppm at the AreaRAE closest to the wreck. This is attributable to the change in atmospheric conditions as the sun rose and began to warm the land. By 0845 VOC levels declined to 0 ppm and have remained at that level as of 1500 hours.

From 1630 to 2100 hours on 12/4, AreaRAEs recorded two VOC exceedances of the 1.0 ppm action limit set by incident command. At one location inside the evacuation zone and situated the closest to the incident, an exceedance was recorded which lasted 11 minutes and peaked at 3.4 ppm (corrected). Another exceedance was recorded which lasted 17 minutes and peaked at 11.0 ppm (corrected). At a second location, outside the evacuation zone along Mantua Creek, an exceedance was recorded which lasted for 26 minutes and peaked at 5.8 ppm (corrected). Recurring brief VOC exceedances have been observed at this location which is one half mile NNW of the accident. ERT has been tasked to collect a 24hr air sample from this location to quantify the potential for exposure over a 24 hour period. RST teams monitored this area through the night. No additional exceedances were observed. Additional 24 hr air samples will be co-located with selected AreaRAEs during the next operational period.

From 2100 hours on 12/4 to 0600 hours on 12/5, zero VOC detections were observed by the AreaRAEs or RST mobile teams. The ERT TAGA bus completed a run through the town, focusing on the perimeter of the evacuation zone at approximately 2200 hours. No quantifiable concentrations of VCM were detected. Another run was initiated at 0530 hours on 12/5 as residents prepare to leave for work. RST teams only detected VOCs at one location during the 1900-0700 shift. A concentration of 2.4 ppm (corrected) was detected at the Crown Point Rd Bridge at approximately 0500 hours. Winds were steady throughout the night significantly improving the air monitoring results.

Conrail's plans for acetone flushing of the remaining VCM from the ruptured tank car have been approved by Unified Command and preparations were made through the night for operations to begin on December 5.

Transfer operations have been complicated by the fact that the only location in which to access the remaining product is through the opening created by impact with a second tank car. The second tank car came to rest in the impact position, thus obstructing the opening. The initial transfer was

accomplished by feeding a two inch tube into the car and using suction created by six railcars under vacuum to remove the product, while introducing nitrogen into the railcar to reduce ignition risks. This operation was effective, however, due to the wreckage limiting access to the opening, the position of the suction tube could not be optimized to completely empty the tank. Approximately 500-700 gallons of product remained.

The current operation will be completed by adding acetone from a truck into the ruptured tank of VCM. The VCM and acetone are miscible and thus the acetone will act as a carrier for the VCM. Unlike water, the introduction of acetone will not trigger rapid evolution of vapor. The resulting increased volume in the car will allow for transfer back into the truck in a manner similar to the first operation. Primary vapor control will be accomplished by drawing vapors from inside the tank using six tank cars which have been placed under vacuum. If needed, a secondary vapor control system will be in place in which a vacuum truck filled with diesel fuel will be utilized to draw vapors from the ruptured car. The recovered vapors will be pulled through the fuel as a primary scrubber and the vacuum-truck exhaust will be polished by activated carbon filters treated with potassium permanganate. At the conclusion of the primary transfer, approximately 500-700 gallons of acetone/VCM mixture will remain. A separate, smaller, suction set-up has been fabricated to reach the remaining product. Following the removal of liquid product, purging the car of vapors will continue using vacuum tank cars and/or scrubber system.

#### **DECEMBER 5, 2012**

During this operational period Conrail initiated pumping at 12:30 hours and continued all day. Throughout the day there were no readings above 0 ppm until 16:45 hours when there was a 2 ppm VOC spike on Crown Point road. The TAGA lab was deployed to the location to confirm the reading and the levels were measured at 0.0 ppm. Periodic spikes in VOC readings are expected as the weather changes and individuals work on and in the tank car.

Product transfer operations were completed at approximately 2300 hours. Following the completion of the product transfer, Conrail commenced flushing/purging remaining fumes and product in the tank car using steam and nitrogen. This process continued through the night until a non-explosive atmosphere was achieved.

EPA OSC Kish attended an 'open house' organized by Incident Command at the Nehaunsey Middle School in Gibbstown, NJ. In addition, the EPA-ERT TAGA lab and staff attended. EPA was able to discuss air monitoring concerns/questions from attendees.

EPA reviewed AreaRAE results from 1600-2100 hours in Viper. No excursions above the 1.0 ppm VC action level were observed. One brief detection of 0.1 ppm was observed which was not sustained. RST mobile teams continued air monitoring while the TAGA bus continued air monitoring as well. From 2100 to 0700 one AreaRAE located on Mantua Avenue recorded a detection lasting approximately 5 minutes that peaked at 0.4 ppm, corrected to VC. A second AreaRAE location situated at the high school registered detections of 0.2 ppm VOC.

#### **DECEMBER 6, 2012**

OSC Kahn reports for duty at 0700 hours. No VOC readings above 0.0 ppm noted. NJDEP has initiated contractor-conducted, house-by-house air screenings by request of residents. The contractor is CTEH, brought in by Conrail for the overall response. As of 0900 hours only one resident has requested screening.

#### **DECEMBER 7, 2012**

Vinyl Chloride Monomer (VCM) tank car pumping, steaming, and nitrogen purging complete - no VCM or LEL readings were obtained inside the VCM tank car.

No VCM readings at EPA fixed stations or mobile air teams for this period. If no VCM air readings are recorded for the previous 24-hr period - ending on 1100 hrs Friday 11/7 - Conrail's consultants and contractors will review all air data obtained to date and present to UC a plan for displaced residents to re-occupy the evacuated residential areas.

Accident site preparation for removal of remaining rail cars - removal of bridge pilings and debris in river, track preparation, etc - is scheduled to begin on Friday, 12/07/12, and is expected to be completed by Saturday, 12/08/12, after which removal of railcars will commence.

ERT commenced deploying SUMMA canisters to the nine (9) locations where the Area RAEs are deployed. The SUMMAs will sample for 24 hours and will be analyzed in the EPA ERT REAC labs in Edison, NJ. Results are anticipated within 24 hours after the samples reach the lab. The first round of SUMMA canisters were deployed during a rain event, so a second round of SUMMA sampling will be conducted after the first group of samples are collected, providing two concurrent 24-hour sampling events.

The web site for Unified Command is up and operational. See Links section of this POLREP for the address.

At 1115 hours today UC informed EPA OSC, through the NJDEP (Env. Unit) that the TAGA lab would be needed on a continuous basis for the duration of the response. Consequently, the TAGA unit presently deployed to the scene will remain on-scene until Monday, 12/10. Some time on the 10th a second TAGA unit from Edison will meet with the first unit in Paulsboro and switch-out units. The unit leaving the scene will return to Edison for required maintenance and the replacing TAGA unit will remain on-scene for the duration of the response.

As of 12 noon today the VOC readings are all 0.0 ppm.

EPA OSC and PAD attended a press conference hosted by NJ Sen. Menendez and USCG COPT (IC).

1530 hours the VOC readings are all 0.0 ppm.

EPA Region 2 PAD provided with unprocessed air monitoring results compiled in conjunction with ERT.

#### **December 8, 2012**

**All air monitoring results 0.0 for this period. SUMMA canisters deployed at fixed air monitoring stations for 24 hr composite sample collection.**

All air monitoring results 0.0 for this period. SUMMA canisters deployed at fixed air monitoring stations for 24 hr composite sample collection.

Second non-haz railcar (lumber) removed; site prep and debris clearing ongoing. Removal of chemical railcars cars tentatively scheduled to begin on Sunday 12/09/12.

UC lifted the residential evacuation and is coordinating home re-entry (started yesterday 11/07/12). Residents re-enter their homes escorted by law enforcement personnel and a hazmat technician (Conrail contractor, CTEH) who monitor for VOCs and Vinyl Chloride Monomer (VCM). As of 1900 hrs, on Friday, 12/07/12, out of approximately 204 homes evacuated, 183 homes have been reoccupied (160 homes cleared, 23 declined air monitoring). It is anticipated that all homes will be re-entered by 1100 hrs Saturday 12/08/12.

1130 hours OSC and DEP access wreck site to obtain updated information on status of wreck site. 1200 hours the two de-railed cars that remained on land were up-righted and removed from the scene. Crane barge is on-station near the bridge and is clearing obstacles from the area. OSC updates OSC.net with new photos.

EPA provided CTEH (contractor for Conrail) with a Google Earth map showing the locations of the Viper AreaRAE monitoring locations.

As of 1600 hours all air monitoring results show 0 ppm for VOCs

#### **December 9, 2012**

All air readings 0 ppm for this period. All air readings 0 ppm overnight. All residents have returned to their homes. Bridge pilings being removed for barge access to for tank car removal.

Conrail is developing a plan for tank car removal to present to UC for review and approval; no projected schedule to begin tank car removal at this time.

As of 0730 hours the RST teams and the TAGA lab are deployed to scene to conduct air monitoring.

At 1130 hours TAGA unit reports getting a VCM reading of 2 PPB, lower than the detection limit of the GC-MS instrument, so this is considered to be a false positive. TAGA unit stayed on station for an additional 30 minutes and did not detect any VCM.

#### **December 9, 2012**

##### **Night Operations:**

Night Operations:

All air monitoring readings 0 ppm for this period.

No night operations at the derailment site for this period. RP is preparing a tank car rigging and safety plan to present to UC for review and approval prior to commencing tank car removal operations.

Additional residences outside of the evacuation area have been monitored and cleared for VCM at the request of the residents To date, 280 residences and 23 business have been monitored and cleared for VCM, 47 residences declined monitoring, and 1 residential monitoring pending scheduling with homeowner.

### **2.1.3 Enforcement Activities, Identity of Potentially Responsible Parties (PRPs)**

One PRP is Consolidated Rail Corporation (Conrail)

### **2.1.4 Progress Metrics**

<i>Waste Stream</i>	<i>Medium</i>	<i>Quantity</i>	<i>Manifest #</i>	<i>Treatment</i>	<i>Disposal</i>

## **2.2 Planning Section**

### **2.2.1 Anticipated Activities**

#### **2.2.1.1 Planned Response Activities**

EPA will continue to support the air monitoring efforts as requested by DEP.

#### **2.2.1.2 Next Steps**

- Continue air monitoring and sampling with hand-helds, Viper system and TAGA lab.

Following the completion of the VCM transfer, the next steps will include the following:

- Use barge cranes to remove debris and lift HazMat rail cars from the creek.
- Removal of all damaged rail cars.

### **2.2.2 Issues**

### **2.3 Logistics Section**

No information available at this time.

### **2.4 Finance Section**

No information available at this time.

### **2.5 Other Command Staff**

No information available at this time.

## **3. Participating Entities**

### **3.1 Unified Command**

US Coast Guard  
Conrail  
NJDEP  
Paulsboro OEM  
NJ OEM

### **3.2 Cooperating Agencies**

US EPA Region II  
US EPA ERT-Edison  
Paulsboro Fire Dept.  
Paulsboro PD  
Gloucester County OEM  
NOAA

## **4. Personnel On Site**

No information available at this time.

## **5. Definition of Terms**

No information available at this time.

## **6. Additional sources of information**

No information available at this time.

## **7. Situational Reference Materials**

No information available at this time.